U. S. Environmental Protection Agency

SUPERFUND PROPOSED PLAN FACT SHEET

Saint Augustine Gas Plant

Removal Action Memorandum

St. Augustine, Florida — August 2000

EPA is recommending a Removal Action involving excavation and disposal of contaminated soil and sediment from the former manufactured gas plant (MGP) site located on Riberia Street in downtown St. Augustine, Florida. The City plans to redevelop the site into a marina, condominium, and retail complex, so this action is expected to be the final response action taken at the site.

This fact sheet summarizes the results of the Engineering Evaluation and Cost Analysis (EE/CA) conducted by the City of St. Augustine and Atlanta Gas Light Company (AGL) under an agreement with EPA.

EPA anticipates negotiating a new agreement with the City and AGL for performance of the Removal Action.

*Terms in **bold** are defined in a glossary on page 10 of this fact sheet.*

EPA Solicits Comments on Cleanup Plan

The U.S. Environmental Protection Agency (EPA) is issuing this ***Proposed Plan*** for the St. Augustine former manufactured gas plant (MGP) site in St. Augustine, Florida to provide an opportunity for public comment on the recommended ***Removal Action*** for addressing soil, sediment, and groundwater contamination at the site. EPA, in consultation with the Florida Department of Environmental Protection (FDEP), will select a final cleanup plan after considering public comments on this Proposed Plan.

EPA issues this Plan under Section 117(a) of the ***Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)***, commonly referred to as Superfund. A public comment period will be held from *August 8, 2000* through *September 7, 2000*, during which EPA will accept written comments on this Plan. If requested, EPA may extend the comment period for another 15 days. In addition, EPA has scheduled a public meeting on Tuesday, August 22, 2000, starting at 6:30 PM to answer questions and receive oral comments on the Proposed Plan. The meeting will be in the City Commission Room at the Lightner Museum/City Hall Complex located at 75 King Street, St. Augustine, Florida.

EPA has established an Administrative Record File containing information considered in preparing this Plan. A copy of the Administrative Record File has been placed in the Information Repository for the site at the following location in St. Augustine:

City Clerk's Office
75 King Street
St. Augustine, Florida 32085
(904) 825-1008

After addressing comments from the public, State, and local officials, EPA will document the final Removal Action decision in an ***Action Memorandum*** and place a copy in the Information Repository noted above. EPA will publish a notice advising the community of the availability of the final Action Memorandum.

Questions about the St. Augustine site or written comments on this Proposed Plan should be forwarded to EPA's Project Manager at the address below:

Mark Fite
EPA Region 4
Atlanta Federal Center
61 Forsyth Street, SW
Atlanta, GA 30303
800-435-9234
fite.mark@epa.gov

Public Meeting... *EPA will host a public meeting on* ***Tuesday, August 22, 2000*** *in the* ***City Commission Room*** *at the* ***Lightner Museum/City Hall Complex*** *beginning at 6:30 pm to give community members an opportunity to*

Site Background

The site is a former manufactured gas plant located at 98 Riberia St. in downtown St. Augustine, Florida. Figure 1 shows the site location, which is east of the San Sebastian River and south of King Street. The plant was constructed in 1885 and utilized a carbureted water process to manufacture gas until the late 1950s.

Coal or coke was heated in a generator, then steam was applied, producing a mixture of carbon monoxide and hydrogen. This mixture was then passed to a carburetor, where it was enriched by a cracking oil. The gas was then sent through a scrubber and condenser where tar and other impurities were removed. Following a final purification step, the gas was pumped to gas holders for distribution to customers. When propane became available, the plant was dismantled.

The site is currently fenced and abandoned, with some foundations and construction debris still visible. Former plant structures were located on the eastern "upland" portion of the site, including gas holders, a gas plant engine room, fuel oil tanks, coal bins, and purifiers (see Figure 2). The site topography is flat and gently slopes toward the San Sebastian River. The western portion of the site is known as the "salt marsh," with elevations near or below the Mean High Water (MHW) level of the San Sebastian River. The entire site is within the 100-year floodplain.

The former MGP site is located in an older urban area of St. Augustine with a mix of commercial, light industrial, and residential land uses. Properties near the site include the Florida Power & Light (FP&L) substation and a movie company (former Ice Plant) to the south; Cooley Stables and Standard Printing to the east (across Riberia Street); and the Solla Carcaba office building (former cigar factory), St. Augustine Police station, Cooper Tire, and others to the north (across Lorida Street). The San Sebastian River borders the site to the west. Residences are located east of Riberia Street along La Quinta Place and Cedar Street.

Beginning in 1987, EPA and FDEP conducted site assessment activities to determine whether further action was needed under CERCLA to address site contamination. A Preliminary Assessment (PA) was completed in 1988 by FDEP, and EPA completed a Site Inspection (SI) in 1992. EPA's Expanded Site Inspection (ESI) was published in April 1997, recommending that further action be taken to investigate and address releases of hazardous substances at the site.

In the meantime, the City of St. Augustine was pursuing redevelopment of the site into a marina complex. In October 1992, the City filed an application with FDEP and the U.S. Army Corps of Engineers (USACE) to dredge the proposed marina harbor. Based on water quality analysis of the San Sebastian River, FDEP issued a dredge and fill permit to the City in July 1995 with a water quality waiver. In September 1997, the USACE completed its review of the permit application, stating that it was prepared to issue the permit, but cited EPA's concerns regarding sediment contamination. Following negotiations with EPA, the City and Atlanta Gas Light Company (AGL) began field work in 1998 to further investigate site contamination.

Final EE/CA Report Available for Review

In order to promote cleanup of the former MGP site and expedite its redevelopment, the City of St. Augustine and Atlanta Gas Light Company (AGL) agreed with EPA to conduct an ***Engineering Evaluation/Cost Analysis (EE/CA)***. The purpose of the EE/CA was to identify the nature and extent of contamination at the site and to develop and evaluate options for site cleanup in the context of the City's redevelopment plans.

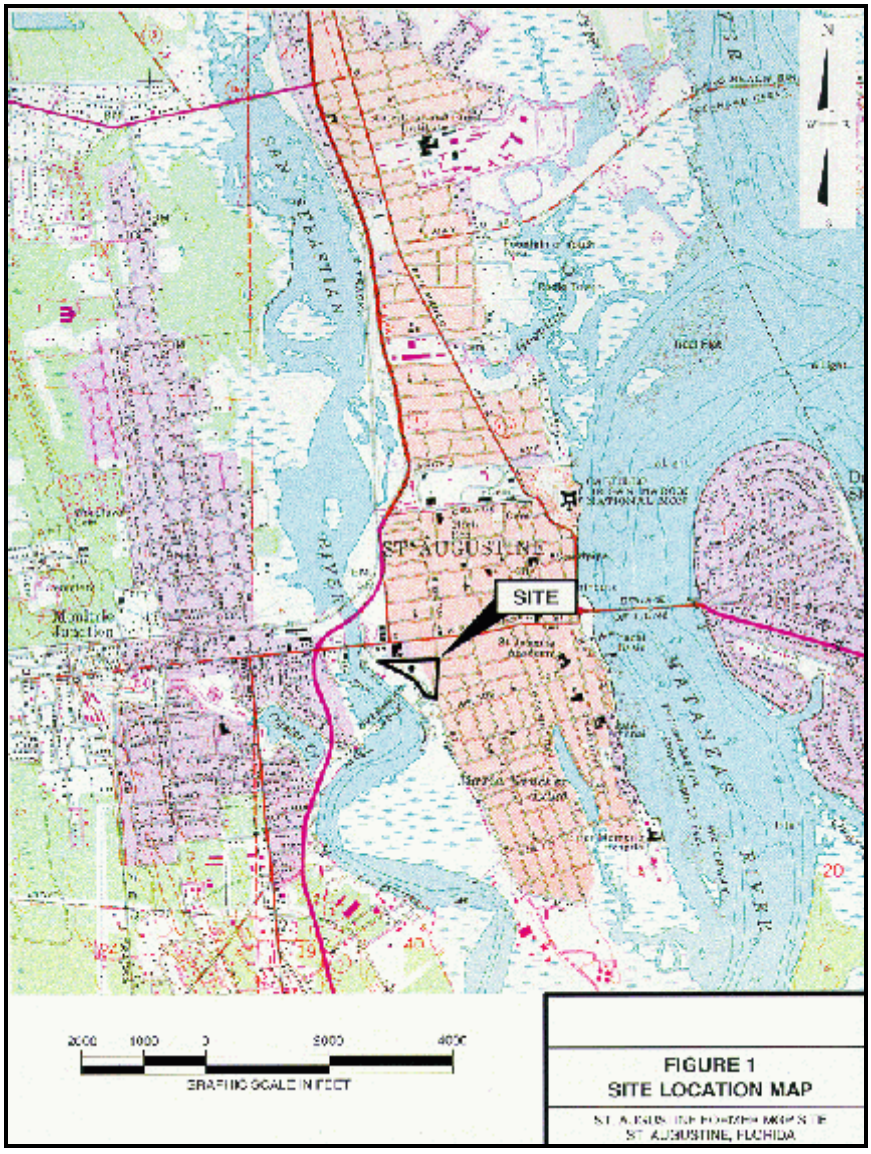
The EE/CA field activities were conducted at the site from September 1998 to February 2000. A copy of the Final EE/CA Report dated April 6, 2000 has been placed in the Administrative Record file at the City Clerk's office, and EPA is seeking public comment on both the EE/CA Report and EPA's Proposed Plan for the site. A summary of the EE/CA is provided below.

Field investigation activities performed as part of the EE/CA included exploratory test trenching, soil borings, monitoring well installation, and soil, sediment, surface water, and groundwater sampling. Former plant operations resulted in the contamination of surface and subsurface soil, marsh sediment, and groundwater. The nature and extent of contamination in various media at the former MGP site are presented in the Final EE/CA Report and are summarized below.

Surface Soil

The surface soil investigation included the collection of 25 surface soil samples taken at a depth of 0 to 6 inches. Samples were analyzed for polynuclear aromatic hydrocarbons (PAHs), and selected locations were analyzed for volatile organic compounds (VOCs), metals, cyanide, and dioxins/furans. Analytical results indicate that surface soil on the site is contaminated with PAHs, metals, and, to a limited extent, dioxins. The PAHs and metals are attributable to MGP operations, but dioxin is not.

An additional 14 surface soil samples were collected throughout the City of St. Augustine to determine the background concentrations of PAHs existing in the urban environment. Results demonstrated that PAHs are widespread throughout the city at low levels, and that surface soil contamination detected off-site (across Riberia St.) is consistent with these background levels.



Subsurface Soil

The subsurface soil investigation consisted of 30 exploratory test pit excavations ranging from 4 to 10 ft. deep and 50 soil borings up to a depth of 35 ft. The presence of MGP-related contamination based on visual and odor indicators was documented in the test pits and borings. In addition, a total of 37 subsurface soil samples were analyzed for VOCs, PAHs, metals, and cyanide. Subsurface soil contamination extends to depth of about 10 feet in the former plant area. Analytical results and visual observations indicated a deeper layer of subsurface soil contamination beneath the former gas plant engine room to a depth of 29 feet and extending north to Lorida Street.

Sediment

To investigate the sediment in the marsh area (the future marina), 44 borings were drilled in the western portion of the site to depths of up to 15 ft below land surface. A total of 83 samples were collected in the marsh area for chemical analysis. All samples were analyzed for PAHs, and 26 samples were also analyzed for VOCs, select metals, and cyanide. Analytical results and visual observations indicate sediment contamination generally extends to a depth of about 1 to 2 feet below the surface, except along the eastern edge of the marsh sediments, where contamination extends to a depth of up to 3 feet. All of the contaminated marsh sediments are within the area of planned dredging for the marina.

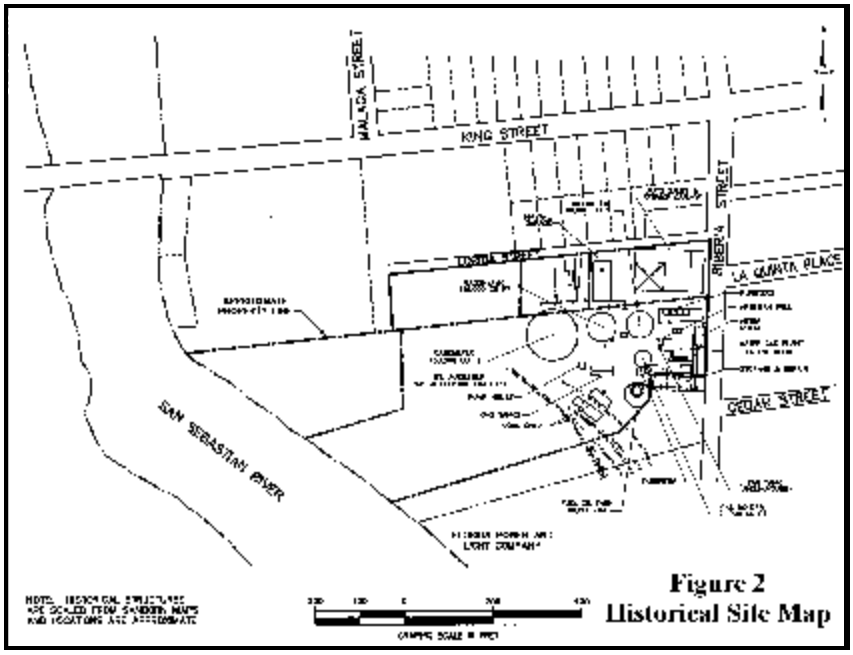
Groundwater

Hydrogeologic units beneath the MGP site are, in descending order, the surficial aquifer, a confining layer, and the Floridan Aquifer. The surficial aquifer ranges in thickness from about 30 to 120 feet, and is generally unconfined. The Floridan Aquifer in the area of the site is confined (under pressure), and there is a strong upward gradient between the Floridan and surficial aquifers. Groundwater beneath the site occurs at a depth of 2 to 4 ft. below land surface (bls). The groundwater investigation focused on the surficial aquifer and consisted of the installation and sampling of 26 monitoring wells at depths of 12 to 14 ft. (shallow) and 30 to 31 ft. (deep). Shallow wells had 10 ft. screens, and deep wells had 5 ft. screens. Based on the groundwater analytical results, dissolved contamination is present in the shallow groundwater which is related to the former operations. A small area of deeper groundwater contamination exists in a shell hash layer below the former plant area linked to the stained soil at 29 ft. bls.

Streamlined Risk Evaluation

A streamlined risk evaluation was conducted to evaluate the risks posed by the site if no action were taken to address contamination detected at the site. Since the City has definite plans to redevelop the site into a marina complex, the risk evaluation assumed that the dredging associated with the marina construction would take place regardless of what action was taken to address environmental contamination.

The first step in evaluating potential risks was to identify chemicals of potential concern (CPOCs) for soil and sediment at the site. Volatile organic compounds (VOCs), PAHs, and metals were identified as COPCs for soil. COPCs for sediment



included ***carcinogenic*** PAHs and arsenic.

The streamlined risk evaluation concluded that there were three groups of people who could come into contact with site contamination. These ***exposure scenarios*** include the following:

Construction Worker: A worker could breath, touch, or ingest (eat) contaminants in soil and sediment during marina construction activities.

Commercial Worker: A person employed at the marina (e.g. a groundskeeper) once it is built could breath, touch, or ingest contaminants in soil remaining at the site.

Recreational User/Resident: A future resident could breath, touch, or ingest contaminants in soil remaining at the site.

Since the nearest drinking water supply well is over 1.5 miles from the site and there is a city ordinance preventing the installation of a supply well on the property, the potential for exposure to groundwater was not evaluated.

Based on the evaluation of these exposure scenarios, EPA determined that actual or threatened releases of hazardous substances from the site, if not addressed by EPA's removal action, may present a current or potential threat to public health and the environment.

The streamlined risk evaluation identified risk-based remedial goal options (RGOs) to serve as cleanup levels for the site. The RGOs represent the following three target risk levels:

- Option 1: Cancer risk level of 10^{-6} and hazard quotient (HQ) of 0.1
- Option 2: Cancer risk level of 10^{-5} and HQ of 1.0
- Option 3: Cancer risk level of 10^{-4} and HQ of 3.0

A cancer risk of $1x10^{-5}$ means that an individual has an additional 1 in 100,000 chance of developing cancer as a result of site-related exposure during a 70 year lifetime. EPA has established a target risk range for Superfund cleanups of between 10^{-4} and 10^{-6}. Based on the evaluation of background and site analytical data and the extent of contaminated soil, Option 2 RGOs were selected as remedial goals since redevelopment plans involve placing 3 ft. of clean fill and paving the upland portions of the site, thereby eliminating contact with any remaining surface soil contamination. Table 1 summarizes the soil remedial goals selected for each COPC at the site.

Table 1
Remedial Goals for Soil

Chemical	Remedial Goal (mg/kg)
Volatile Organic Compounds	
Benzene	12
1.2-Dibromo-3-chloropropane	6.7
Tetrachloroethene	96
Semivolatile Organic Compounds	
Non-Carcinogenic PAHs	
Fluoranthene	10,000
Fluorene	10,000
1-Methylnaphthalene	230
2-Methylnaphthalene	210
Naphthalene	200
Phenanthrene	6,800
Pyrene	8,200
Carcinogenic PAHs	
Benzo(a)anthracene	7.2
Benzo(a)pyrene	0.72
Benzo(b)fluoranthene	7.2
Benzo(k)fluoranthene	72
Chrysene	720
Dibenzo(a,h)anthracene	0.72
Indeno(1,2,3-cd)pyrene	7.2
Dioxins	
2,3,7,8-TCDD equivalents	0.001
Inorganic Compounds	
Antimony	82
Arsenic	58
Barium	14,000
Cadmium	68
Chromium	77
Copper	8,000
Cyanide	4,100
Iron	56,000
Lead	400
Manganese	22,000
Mercury	20
Thallium	32
Vanadium	610
Zinc	48,000

S1: No Action. No removal action would be taken except in connection with dredging the marina. The marina would be constructed on the site as is, and the risks are defined by the streamlined risk evaluation. The proposed parking lot would cover most of the contaminated soil.

Since this alternative will not satisfy risk-based remedial goals, it was not retained for further evaluation.

Summary of Removal Action Alternatives

In accordance with the National Contingency Plan (NCP) and EPA's EE/CA guidance, Removal Action alternatives were developed for surface and subsurface soil in the plant area, soil and sediment in the marina area, and groundwater. Each alternative is described below:

Surface and Subsurface Soil

S2: Institutional Controls and Groundwater Monitoring. The current marina development plans call for a paved parking lot in the area of contaminated soil in the plant area. Prior to paving, soil will be added to regrade the upland portion of the site to at least 3 feet above the current elevation. Institutional controls would include deed restrictions requiring the area to be maintained as a parking lot or physically limiting access; buildings would be built in a manner that prevents vapors from underlying contaminated soil from entering the buildings. A City ordinance requires connection to the public water supply, since any structure on the site would be within 200 feet of an existing water line. Though county or State permits are required for installation of domestic or irrigation wells, deed restrictions will be imposed to prevent the installation of water supply wells. A health and safety plan would be required for all excavation and other subsurface work at the site. This alternative would include sampling of groundwater and analysis for VOCs and PAHs from 3 to 5 monitoring wells along the perimeter of the proposed marina for up to 30 years.

This alternative will be retained for further evaluation.

S3: Excavation of Soil Above the Groundwater Table. This alternative includes excavation of contaminated soil to the groundwater table (a depth of about 4 feet) in the former plant area and excavation to a depth of 2 feet in remaining areas exceeding remedial goals. Soil would either be disposed of off-site at a landfill or thermally treated. The institutional controls described for Alternative S2 (except deed restrictions) and annual groundwater monitoring for up to 30 years would also be required. Excavating to 4 feet will leave a substantial amount of contaminated soil below the water table, which could have an adverse impact on groundwater. Since other excavation alternatives provide a greater degree of protection, this alternative will not be retained for further evaluation.

S4: Excavation of Shallow Soil to 8 Feet and Hot-Spot Removal to a Depth Up to 30 Feet in the Source Area. This alternative includes excavation of contaminated soil to 8 feet in the plant area and 5 feet in the vicinity of the former 88,000 gallon fuel oil tank (see Figure 3). In addition, the hot spot area beneath the former plant building and 20,000 cf gas holder would be excavated to a depth of up to about 30 feet (also shown in Figure 3). Surface soil throughout the remainder of the site which exceeds remedial goals will be excavated to a depth of 2 feet. The excavated soil would either be disposed of off site at a landfill or thermally treated. A wellpoint dewatering system and excavation support system would be required for a portion of the excavation. Some of the institutional controls described for Alternative S2 would be required, including deed restrictions preventing well installation and specifying building construction methods in the remaining deep-stained soil areas. Groundwater from 3 to 5 wells along the marina

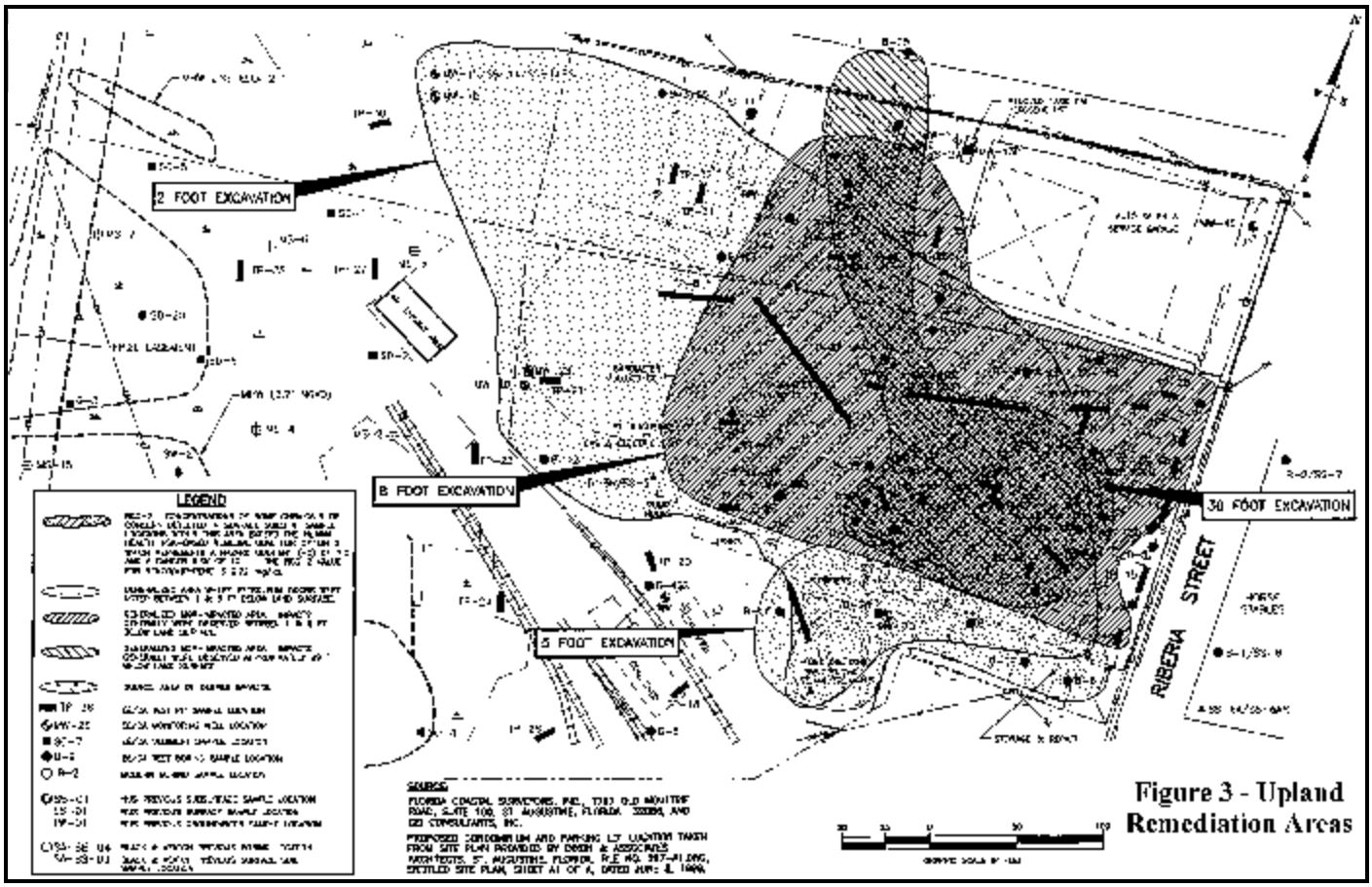


Figure 3 - Upland Remediation Areas

perimeter and downgradient of the excavated source area would be sampled and analyzed annually for VOCs and PAHs for 5 years to evaluate the effectiveness of this removal action. The excavation would remove more than 99% of the source material

This alternative will be retained for further evaluation.

S5: Excavation of Soil Above the Groundwater Table and In-Situ Stabilization of Soil Below the Groundwater Table. This alternative would include excavation of contaminated soil in the plant area to a depth of about 4 feet as in Alternative S3, and surface soil exceeding remedial goals outside this area to a depth of 2 feet. The soil would either be disposed of off site at a landfill or thermally treated. Contaminated soil in the plant area from 4 to 12 ft. would be stabilized in-situ with cement using deep soil mixing techniques. The deeper source area would be stabilized to a depth of 32 feet. It is estimated that about 30% of the treated soil would return to the surface as spoil during deep soil mixing. A portion of the spoil would be used to backfill the 4-foot excavation, and the remaining spoil would either be disposed in an off-site landfill or thermally treated.

The institutional controls described for Alternative S4 would be required, along with a notice to potential developers or site owners of the presence of cement-stabilized soil that may impact the design and installation of deep building foundations. Groundwater from 3 to 5 wells along the marina perimeter and downgradient of the excavated area would be sampled and analyzed annually for VOCs and PAHs for 5 years to evaluate the effectiveness of this removal action.

This alternative would address at least 99% of the source material and will be retained for further evaluation.

Deep-Stained Soil

The EE/CA also evaluated the following options for addressing stained soil between 25-30 ft bls in a narrow band running northwest to Lorida St.:

D1: No Action. No removal action would be taken.

Since this material could potentially impact groundwater quality, the No Action alternative will not be retained for further evaluation.

D2: Institutional Controls and Groundwater Monitoring. Institutional controls preventing well installation, requiring health and safety plans, and specifying building construction methods in the deep-stained soil area would be implemented. This alternative involves collecting samples annually from deep monitoring wells located outside the deep-stained soil area and analyzing for VOCs and PAHs for 30 years.

This alternative will be retained for further evaluation.

D3: Excavation of Deep-Stained Soil Outside of the Deep Source Area. This alternative would be performed in conjunction with S4 and includes excavation of the deep-stained soil outside of the deep source area to a depth up to about 30 feet based on the estimated extent of deep-stained soil shown in Figure 3. Uncontaminated soil above the deep-stained soil may be stockpiled and reused to backfill the excavation. Contaminated soil would either be disposed in an off-site landfill or thermally treated. A dewatering system and excavation support system would be required for the excavation. Institutional controls preventing well installation in the downgradient contaminated groundwater area would be required until the groundwater quality attains background conditions. Groundwater samples from deep wells downgradient of the excavated deep-stained soil would be analyzed annually for VOCs and PAHs for 5 years to evaluate the effectiveness of the removal action.

This alternative will be retained for further evaluation.

D4: In-situ Stabilization of Deep-Stained Soil Outside of the Deep Source Area. This alternative would be performed in conjunction with S4 or S5 and would include in-situ stabilization of deep-stained soils outside the deep source area with cement using jet grouting or deep soil mixing techniques. It is estimated that the interval of contaminated soil is from a depth of 25 to 30 feet. Jet grouting or deep soil mixing is expected to result in about 30% of the treated soil returning to the ground surface as spoil. Contaminated spoil would either be disposed in an off-site landfill or thermally treated. The institutional controls described for Alternative D3 would be required, along with the notification of potential developers or site owners of the presence of cement-stabilized soil that may impact the design and installation of deep building foundations. Deep wells downgradient of the stabilized soil would be monitored annually for VOCs and PAHs for 5 years to evaluate the effectiveness of the removal action.

This alternative will be retained for further evaluation.

Sediment

SD1: Dredging and Off-Site Disposal/Treatment of Sediments. The areas of contaminated sediment to be removed from the marina area are shown on Figure 4. The easternmost area would be dredged to a depth of up to 3 feet to remove

the visible contamination and sediment exceeding the Probable Effects Level (PEL). The smaller western area would be excavated to a depth of 2 feet to remove the shallow sediment areas which exceed the PEL. The sediment from the larger easternmost area would be disposed of at a landfill or thermally treated. The sediment from the smaller PEL exceedance area and remaining sediment to be dredged from the marina would be managed in accordance with state and federal regulations based on the stockpile sampling analytical results. No long-term monitoring is planned.

This alternative will be retained for further evaluation.

SD2: Dredging and On-Site Reuse of Sediments. This alternative involves dredging of contaminated sediment as described in SD1 and placement on the upland (eastern) portion of the site as backfill. However, tests performed on lime-treated sediment samples suggested that reuse of the sediment on site for structural fill may not be feasible or cost-effective. Therefore, this alternative was not retained for further evaluation.

Groundwater

G1: No Action. No Removal Action would be taken. A no-action alternative would not prohibit the installation of water supply wells in the future. As a result, this alternative will not be retained for further evaluation.

G2: Institutional Controls and Groundwater Monitoring. The City currently has an ordinance which requires connection to the public water supply since the site is within 200 feet of existing water lines. Additionally, the County Health Department requires permits for all wells up to 3 inches whether for domestic or irrigation needs, and the St. Johns Water Management District requires permits for all wells greater than 3 inches. Although the City has an ordinance preventing well installation at the site, a deed restriction to prevent well installation would be used as an extra level of protection. This alternative includes groundwater monitoring from 3 to 5 wells located around the marina perimeter and downgradient of the deep-stained soil.

This alternative will be retained for further evaluation.

G3: Air Sparging. This alternative would include the installation of an air sparging system to remove the VOCs and low molecular weight (LMW) PAHs in groundwater to below Florida Maximum Contaminate Levels (MCLs). Although there are a variety of ways to design and implement an air sparge system, the following scenario was developed for evaluation: One system would be installed north of Lorida Street to a depth of 35 feet to treat the deeper groundwater contamination. The other system, installed at the northeast corner of the proposed

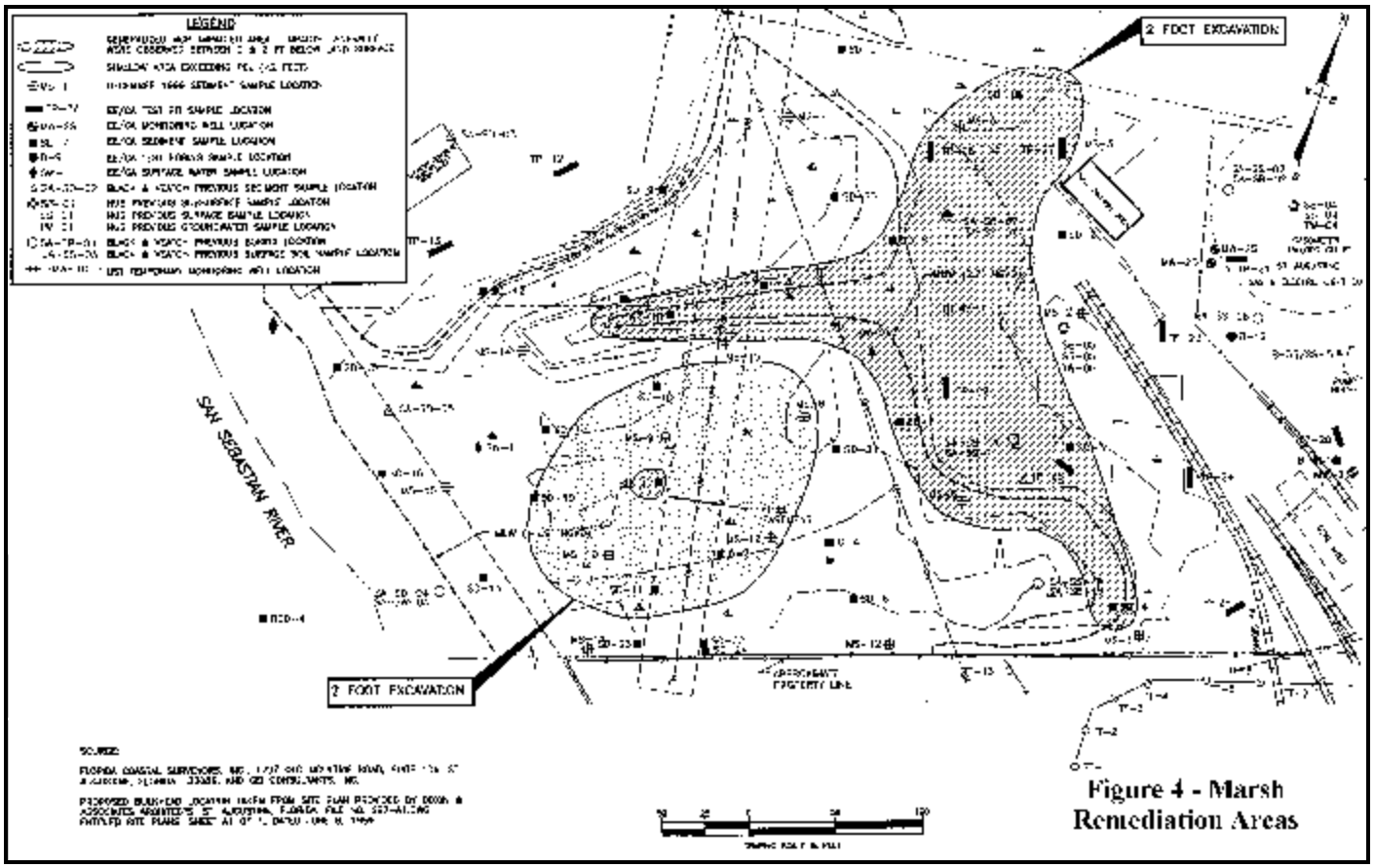


Figure 4 - Marsh Remediation Areas

marina basin, would treat shallow contaminated groundwater before discharge to the proposed marina basin. This system would be installed to a depth of approximately 15 feet. Both systems would consist of air injection wells connected by underground piping to an air compressor. Horizontal slotted pipe buried 3 feet below ground surface would be installed, if necessary, to collect soil gases. Soil vapor would be treated using activated carbon before discharge through a short stack. Groundwater monitoring would be required along the marina perimeter and downgradient of the deep-stained soil areas.

The exact number and spacing of wells and the air flow rate and pressure would be determined as part of the removal design using data from a field pilot study. This alternative will be retained for further evaluation.

Analysis of Removal Action Alternatives

Several alternatives were eliminated in the initial screening because they were not considered protective of human health and the environment or they did not achieve the Removal Action objectives. The following Removal Action alternatives were retained for detailed evaluation:

Surface and Subsurface Soils

- S2: Institutional Controls and Groundwater Monitoring
- S4: Excavation of Shallow Soil to 8 feet and Hot-Spot Removal to a Depth Up to 30 feet
- S5: Excavation of Soil Above Groundwater Table and In-situ Stabilization of Soils Below the Groundwater Table

Deep-Stained Soil

- D2: Institutional Controls and Groundwater Monitoring
- D3: Excavation of Deep-Stained Soil
- D4: In-Situ Stabilization of Deep-Stained Soil

Sediment

- SD1: Dredging and Off-Site Disposal/Treatment of Sediment

Groundwater

- G2: Institutional Controls and Groundwater Monitoring
- G3: Air Sparging

In this section, the performance of each alternative relative to the other alternatives will be evaluated for each of the evaluation criteria listed below. This analysis will enable EPA to select a plan of action for the site which ensures protection of human health and the environment, poses minimal implementation problems, and provides the best cleanup for the cost.

Surface and Subsurface Soil

Effectiveness

- **Overall Protection of Public Health and the Environment.** Alternatives S4 and S5 are similar because they would both remove or stabilize more than 99% of the impacted soil (including the deep source area) that results in risk from direct exposure, and impacts shallow and deeper groundwater quality.

- **Compliance with ARARs.** S4 and S5 are similar because they would both significantly reduce the potential for exceedances of MCLs and surface water standards by removing/stabilizing more than 99% of the source material.

- **Long-Term Effectiveness and Permanence.** Both S4 and S5 will provide long-term protection against risk from direct exposure and groundwater and surface water quality exceedances.

- **Reduction of Toxicity, Mobility or Volume Through Treatment.** S4 is considered the most effective alternative in reducing toxicity, mobility, and volume because the excavation would remove more than 99% of the impacted soil from the site.

- **Short-Term Effectiveness.** The short-term effectiveness of S2 is considered the highest because its implementation will not affect the community. The short-term effectiveness of S5 is considered higher than S4 because less soil would be excavated and transported off site through the community.
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Implementability

- **Technical Feasibility.** Alternative S2 is the easiest to implement. S5 is ranked higher than S4 because although excavation and replacement are standard procedures, they are considered more difficult than in-situ stabilization at depths of 30 feet.

- **Administrative Feasibility.** Institutional controls of varying degrees will be required for all three alternatives, but they would be more difficult to implement as the sole remedy.

- **Availability of Services and Materials.** As described above, there are more experienced contractors for excavation and replacement than for in-situ stabilization.

State Agency Acceptance. FDEP has expressed support for Alternative S4 in combination with the other alternatives recommended by EPA.

Community Acceptance. EPA is seeking community input on all of the soil alternatives evaluated in the EE/CA and this Plan.

Cost

Present worth costs for S4 and S5 depend on whether soil is landfilled (cheaper) or thermally treated:

- S2: $250,000

- S4: $5.8-$7.3 million
- S5: $5.0-$5.9 million

Alternative S5 has a lower overall cost than S4, but S4 is more effective at meeting Removal Action objectives because contaminated soil would be removed from the site.

Deep-Stained Soil

Effectiveness

- **Overall Protection of Public Health and the Environment.** Alternatives D3 and D4 are similar because they would remove or stabilize deep-stained soil that could potentially continue to impact deep groundwater quality. However, D2 would provide nearly equivalent protection because the groundwater analytical results for deep monitoring wells installed immediately downgradient of the deep-stained area indicate that natural conditions limit the migration of dissolved constituents from the deep-stained soil.

- **Compliance with ARARs.** D3 and D4 are similar because they would both reduce the potential for exceedances of MCLs. It is expected that D2 would provide nearly equivalent protection if combined with S4 or S5. None of the alternatives are expected to result in exceedances of surface water standards.

- **Long-Term Effectiveness and Permanence.** Both D3 and D4 will provide long-term protection because they will either remove or stabilize contaminated soil. However, the impact caused by the deep-stained soil is very low compared to the impact caused by material in the source area.

- **Reduction of Toxicity, Mobility or Volume Through Treatment.** D3 is considered the most effective alternative in reducing toxicity because excavation would remove the impacted soil from the site. Alternative D4 would reduce the mobility of the impacts.

- **Short-Term Effectiveness.** The short-term effectiveness of D2 is considered high because it would result in less impact on workers and on the community. D4 is ranked higher than D3 because D3 would require soil to be excavated and transported through the community.

Implementability

C **Technical Feasibility.** D2 is the easiest alternative to implement. D4 has a higher technical feasibility than D3 because excavation and replacement are more difficult than in-situ stabilization at a depth of 30 feet.

C **Administrative Feasibility.** Institutional controls would be required for all three alternatives, but they would be slightly more complex to implement for D2 and D4 because of the restrictions required for future development. Mechanisms for institutional controls are readily available.

C **Availability of Services and Materials.** As described above, more experienced contractors exist for excavation and replacement than for in-situ stabilization. The mechanisms for institutional controls are readily available.

State Agency Acceptance. FDEP has expressed support for Alternative D2 in combination with the other alternatives recommended by EPA. , institutional controls, especially in combination with S4 or S5, which will remove more than 99% of the mass of contaminants.

Community Acceptance. EPA is seeking community input on all the Deep-Stained Soil alternatives considered for the site.

Cost

Costs for D3 and D4 depend on whether sediment is landfilled (cheaper) or thermally treated:

- D2: $250,000
- D3: $1.9-$2.0 million
- D4: $0.9-$2.5 million

Alternatives D3 and D4 have very high costs for marginal human health and environmental benefit. There is no direct exposure to the deep-stained soil at the site and the source of the impacts will be removed. The deep-stained soil impact on groundwater is minimal. Although groundwater discharges to the marsh area, surface water quality data, the streamlined risk evaluation, and dilution modeling do not indicate negative impacts.

Sediment

No comparison of alternatives is given for sediments since only option SD1 passed the original screening.

Groundwater

- **Overall Protection of Public Health and the Environment.** Alternatives G2 and G3 are similar because they would both prevent potential exposure to the public. However, G3 may also provide additional protection to potential ecological receptors in the time period between the potential soil Removal Action and the time it takes for the groundwater impacts to naturally attenuate.

- **Compliance with ARARs.** Alternatives G2 and G3 are similar because they would both reduce contaminant concentrations in groundwater. However, G3 may achieve compliance with ARARs sooner than G2.

- **Long-Term Effectiveness and Permanence.** Alternatives G2 and G3 will provide equivalent long-term protection from direct exposure to contaminated groundwater and surface water over time.

- **Reduction of Toxicity, Mobility, or Volume Through Treatment.** Alternatives G2 and G3 would reduce the toxicity, mobility, and volume of groundwater impacts.

However, the rate of reduction likely would be accelerated by G3.

- **Short-Term Effectiveness.** The short-term effectiveness of G2 is considered higher than G3 since there would be fewer disruptions to the community and potential exposures to remedial workers because G2 only requires well installation, whereas G3 would require the installation of wells, piping, and equipment buildings.

Implementability

C **Technical Feasibility.** G2 is the most technically feasible alternative because it would be much less difficult to successfully implement compared to G3.

C **Administrative Feasibility.** Institutional controls would be required for both alternatives, however they would be more difficult to implement for G3 due to the need to obtain access agreements from private property owners.

C **Availability of Services and Materials.** The services and materials for both alternatives are readily available.

State Agency Acceptance. FDEP has expressed support for G2 in combination with the other alternatives recommended by EPA.

Community Acceptance. EPA is seeking community input on all Groundwater alternatives considered.

Cost

The range of costs for G3 depends on the duration of treatment (either 5 or 30 years).

- G2: $336,000
- G3: $0.6-$1.6 million

Alternative G3 has a high cost compared to G2 for marginal human health and environmental benefit. The effectiveness of G2 and G3 is similar, although the timeframe for achieving contaminant reduction would be longer for G2 than G3.

EPA's Recommended Removal Action

Based on the comparative evaluation, EPA recommends the following alternatives for addressing contamination at the site:

S4. Excavation of Shallow Soils to 8 feet and Hot-Spot Removal to a Depth Up to 30 feet. This alternative will remove over 99% of contaminated soil that could continue to impact groundwater.

D2. Institutional Controls and Groundwater Monitoring are recommended to address deep-stained soils. Although D3 and D4 ranked higher than D2, they have very high cost for only marginal reduction in risk posed by the deep-stained soil.

SD1. Dredging and Off-Site Disposal or Treatment of Sediments is recommended for sediment.

G2. Institutional Controls and Groundwater Monitoring is recommended to address groundwater.

Cost

The overall cost for this Removal Action totals approximately $7.0 million. This total includes the combined costs of alternatives S4 ($5.8 million assuming landfill disposal of excavated material), D2 ($250,000), and SD-1 ($0.9 million assuming landfill disposal). The costs for groundwater institutional controls and monitoring are included in alternatives S4 (for 5 years) and D2 (for 30 years).

Glossary

Applicable or Relevant and Appropriate Requirements (ARARs): Federal or State standards from other environmental laws which relate to contaminants or circumstances similar to those found at a Superfund site. These regulations provide the basis for the cleanup levels and other cleanup requirements at Superfund sites.

Aquifer: Underground formation of sand, soil, rock, or gravel that can store and supply groundwater.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA): The law which provides authorization and funding for EPA to address contamination at abandoned or unregulated hazardous waste sites.

Engineering Evaluation and Cost Analysis (EE/CA): Study conducted as part of the Removal process to collect necessary data to determine the type and extent of contamination at the site and evaluate alternatives for addressing this contamination.

Groundwater: Water found beneath the earth's surface that fills the pores between sand, soil, or gravel.

National Contingency Plan (NCP): The regulation that implements the Superfund law and prescribes how cleanup activities will be conducted.

Proposed Plan: Superfund public participation fact sheet which summarizes the preferred cleanup strategy and the rationale and a summary of the RI/FS.

Removal Action Memorandum: Legal document that formally selects the cleanup plan for the site.

Superfund: The trust fund established to finance the cleanup of abandoned hazardous waste sites under CERCLA. This is also the

common term used to refer to the
CERCLA statute.

USE THIS SPACE TO WRITE YOUR COMMENTS

Your input on the Proposed Plan for the ST. AUGUSTINE GAS PLANT Site is important in helping EPA select a final remedy for the site. You may use the space below to write your comments, then fold and mail. Additional comments may be included with this form.

Name _____

Address _____

_____

Phone # _____

SAINT AUGUSTINE GAS PLANT SUPERFUND SITE

PUBLIC COMMENT SHEET

Fold on dashed lines, staple, stamp and mail

Place Stamp Here

Name _____
Address _____
City _____ State __Zip ___

Mark Fite, Remedial Project Manager
South Site Management Branch/Waste Division
U. S. EPA, Region 4
61 Forsyth Street, SW
Atlanta, GA 30303

EPA Supports the City's Redevelopment Efforts

The City of St. Augustine began planning the redevelopment of the former gas plant site many years ago, and selection of a cleanup plan for the site will bring the realization of that dream one step closer.

In 1999, EPA announced a national effort, the Superfund Redevelopment Initiative, to help communities return Superfund sites to productive use. In pursuing its mission of cleaning up the nation's worst hazardous waste sites, the Agency has always recognized the importance of considering future use opportunities. Now, with this Initiative, EPA has put in place a coordinated national program to make sure that at every cleanup site, the Agency and its partners have an effective process and the tools and information needed to fully explore future use before EPA implements a cleanup remedy. This process helps EPA select remedies consistent with the likely future use of a site, which in turn gives communities the opportunity to realize productive futures for sites that have been made safe.

EPA's hope is that our partnership with the City in the cleanup and redevelopment of the former gas plant will make our mutual goal to protect and improve the health and welfare of the people and environment of St. Augustine a reality.

For more information on EPA's Superfund Redevelop Initiative, visit www.epa.gov/superfund/programs/recycle on the web

United States
Environmental Protection
Agency

South Site
Management Branch

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ST. AUGUSTINE GAS PLANT PROPOSED PLAN